A Petition for a Second Month Extension of Time, up to and including June 4, 2000, is being filed concurrently in order to timely file this Response.

Applicant appreciates the Examiner's thoughtful consideration of Applicant's Preliminary Amendment and Declaration under 37 CFR §1.132 and supporting documents.

I) 35 U.S.C. §112, First Paragraph Rejection

As to 35 U.S.C. §112, first paragraph, Applicant states that there is sufficient support in the Specification and the references cited therein to support the present invention.

In particular, the present invention (TCS: thought controlled system) utilizes the fact that biogmagnetic potentials at particular precise locations in the brain of the user are found to be consistent with a particular *thought* of the user. For example, in accordance with Walter et al.,[1] the *thoughts* of "moving the foot", or "moving the thumb," or "moving the index finger" generate particular stimuli at precise locations in the person's brain. Thus, *the detection of particular stimuli corresponding to a particular thought* is known in the art. The TCS utilizes this relationship to then make an association of these particular stimuli and user *thoughts* with a user-desired control function which is then implemented as explained in Figs. 1-3 and pp.19-46 of the present application in order to control a device or system, e.g., a computer. As an example, the present application states:

> ...Each stimulus or group of stimuli is identified with a unique designation so that the user can associate stimuli with his or her (related) thoughts. TCS provides for designations of the user's choice to be displayed or otherwise communicated to the user. For example, TCS may display related predetermined pictures or the brain pictorially with the location of each stimulus received. The user may choose a display of the entire brain

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[1]Walter et al. "Individual Somatotopy of Primary Sensorimotor Cortex Revealed by Intermodal Matching of MEG, PET, and MRI" Brain Opography, 1992, Vol. 5, No. 2, p. 186, Table 1.

or a part thereof. The user makes the final choice as to which designation will identify which of the stimulus, or group of stimuli, is used to evoke a particular function of the computer. This information is recorded in the stimuli profile... (present application, p. 30, lines 1-9).

The stimuli selection 204 and function designation 205 of the TCS discussed on pages 26-31 of the present application provide the requisite detail about how this association and control are achieved. Thus, the present application provides ample support in accordance with 35 U.S.C. §112, first paragraph as to how a user's thoughts are utilized in controlling a device/system.

Therefore, Applicant respectfully requests that the §112, first paragraph rejection be withdrawn against Claims 1, 55 and 67-70.

II) 35 U.S.C. §102(b) Rejection

Claims 1, 4, 9, 12, 15, 17, 21, 38, 40, 51, 55 and 67-70 have been rejected under §102(b) as being anticipated by U.S. Patent No. 5,474,082 (Junker).

However, there *are* structural differences between the present invention and the Junker patent. Junker does *not* include the following elements of Claims 1, 67 and 69 of the present application:

> 1. function selection means for receiving said at least one stimulus and wherein said function selection means comprises a memory *including a correspondence between a plurality of previously stored user stimuli and a plurality of desired control functions*; and

> 2. identification means, coupled to said function selection means, *for comparing said at least one stimulus to said correspondence to identify a function control signal corresponding to said at least one stimulus*, said function control signal being transmitted to the operation system of said computer.

Neither of these elements are shown in Junker. With respect to the assertion that the function selection means comprising a memory is met by the data store 19 of Junker in which brain-body signals are stored, Junker does not show nor suggest a _correspondence between a plurality of previously stored user stimuli and a plurality of desired control functions_[2]. With respect to the assertion that the identification means is met by the foreground loop processor 39 of Junker, nowhere is there shown or suggested in Junker apparatus _for comparing said at least one stimulus to said correspondence to identify a function control signal corresponding to said at least one stimulus_[3]. Thus, neither of these two elements are shown, taught nor suggested in Junker.

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[2]In fact, the only thing that Junker states about the data store 19 is the following:

> "The digital brain-body signal is stored in data store 19 with each sample." (col. 7, lines 2-3).

> "The data store 19 stores data associated with the execution of programs within the background loop processor 35 and foreground loop processor 39. (col. 7, lines 42-45).

[3]The fact that Junker uses a foreground loop processor 39 which uses the brain-body signal as a basis for the presentation of various audio and visual feedback still does not show nor suggest apparatus for _comparing of at least one stimulus to a correspondence between a plurality of previously stored user stimuli and a plurality of desired control functions_ is shown. Furthermore, the actual excerpt from Junker concerns a _display_ program 37:

> "The display generation program 37 within the foreground loop processor 39 uses the brain-body signal and generated control signals as a basis for the presentation of various audio and visual feedback to the user.

As mentioned earlier, during operation of the present invention, the present invention does not require audio and visual feedback.

4

Nor does Junker disclose the following elements specified in Claims 55, 68 and 70:

> (b) selecting means for receiving one or more of said detected stimuli to perform a function *and selecting a correspondence to one or more user thoughts[4] to produce a selected function* and wherein said selecting means does not require an articulated response from the user; and

> (c) identification means *for identifying one or more said detected stimuli as corresponding to said selected function* for producing a function control signal,

With respect to the assertion that the selecting means is met by the user input devices 20 (such as the keyboard, mouse and others) of Junker, nowhere is there shown or suggested in Junker where such user input devices *select a correspondence to one or more user thoughts[5] to produce a selected function*. With respect to the assertion that the identification means is met by the foreground loop processor 39, as stated previously with respect to Claims 1, 67 and 69, nowhere does Junker show or suggest that the processor 39 *identifies one or more said detected stimuli as corresponding to said selected function for producing a function control signal*.

A functional diagram of these distinctions are depicted in the attached Exhibit A labeled "Comparison of Junker to TCS". In a typical biofeedback system, such as Junker, the user is in a loop, i.e., the user watches a system and attempts to manipulate controls of the system by concentrating on a particular feature (e.g., a cursor in Junker); if he/she

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[4]In Claim 68, the term "thought" is replaced with "thought patterns" and in Claim 70 the term "thought" is replaced with "thought categories."

[5]In Claim 68, the term "thought" is replaced with "thought patterns" and in Claim 70 the term "thought" is replaced with "thought categories."

is successful, the manipulation is achieved; if he/she is not successful, the user must somehow modify his/her concentration to manipulate the desired control. Thus, system control is limited and short term: as long as the user is watching, or somehow perceiving the state of the system on a substantially continuous basis, he/she can manipulate a specific control by concentrating.

In contrast, the TCS does *not* require the loop structure, i.e., the user does *not have to be monitoring the status of the system to achieve control*. For example, if a blind person wished to control a computer, say to print a document, using the present invention, the user need only think a predefined thought, e.g., "move a finger" and the invention interprets the stimuli that are activated when he/she thinks about moving a finger to command the computer to print the document[6]. Thus, using the TCS, the user avoids the "feedback" required of systems that utilize biomagnetic potentials.

How is this accomplished? As discussed previously, because the TCS has stored an association between stimuli generated when the user thinks about, e.g., moving a finger with "printing a document," *whenever* the TCS detects the particular stimuli from the user that correspond to "moving a finger", the TCS commands the computer to print a document. Thus, there is no feedback required by the user[7]. He/she does not need to concentrate on moving a cursor, e.g., upward and to the left to position it on the "PRINT"

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[6]See present application p. 42, line 17 - p. 43, line 2; p. 41, line 16 to p. 42, line 2; and p. 42, lines 13-16.

[7]It should be understood that once in operation the present invention does not require a loop structure. However, when first associating a particular designation with a stimulus (or stimuli) input, there is a need for feedback as stated on p. 30, lines 1-9: "TCS feedback to the user is consistent with good human factors; Each stimulus or group of stimuli is identified with a unique designation so that the user can associate stimuli with his or her (related) thoughts...The user makes the final choice as to which designation will identify which of the stimulus, or group of stimuli, is used to evoke a particular function of the computer. This information is recorded in the stimuli profile..."

command in the screen. Such detailed and difficult manipulation is entirely avoided by the present invention by utilizing the "thought" of the user.

Thus, for all of these reasons, Applicant respectfully submits that Junker does not anticipate Claims 1, 55, and 67-70 and respectfully requests that the §102(b) rejection be withdrawn. Furthermore, for the same reasons, all of the dependent claims, namely Claims 4, 9, 12, 15, 17, 21, 38, 40, 51, are also patentable over Junker.

III) 35 U.S.C. §103(a) Rejections

Claims 2, 18 and 44-45 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Junker in further view of particular secondary patents.

With regard to Claim 2, Junker is cited in combination with U.S. Patent No. 5,594,849 (Kuc et al., hereinafter "Kuc"). In particular, Junker has been cited as including all of the elements of Claim 1 except for the magnetic source imaging means specified in Claim 2. To make up for that deficiency, Kuc is combined with Junker as providing such magnetic source imaging means. It is asserted that since Junker "utilizes bio-imaging means to achieve its purposes, it [Junker] presents the perfect platform onto which an imaging system such as Kuc may be applied."

However, since Claim 2 is dependent upon Claim 1, Claim 2 is patentable for the same reasons. In addition, as stated in previous responses by Applicant, Junker is directed to the recognition that an aggregate signal of EEG and EMG biopotentials is necessary for proper feedback which is limited to interpreting frequency spectra detected on the body. Junker does not teach or even suggest implementing localization, i.e., determining coordinates of stimuli generated by the thoughts of the user, as is accomplished by the stimuli input means of the present invention which can be achieved

7

using magnetic source imaging, such as that suggested by Kuc. Thus, there is no incentive to even combine Junker with Kuc. Therefore, for all of the above reasons, Applicant respectfully submits that Claim 2 is patent able over the art of record and respectfully requests that the §103(a) rejection be withdrawn.

With regard to Claim 18, Junker is cited in combination with U.S. Patent No. 4,949,726 (Hartzell et al.). However, since Claim 18 is dependent upon Claim 1, Claim 18 is patent able over the art of record for the same reasons.

With regard to Claims 44-45, Junker is cited in combination with U.S. Patent No. 5,325,133 (Adachi). However, since Claims 44-45 are dependent upon Claim 1, Claims 44-45 are patent able over the art of record for the same reasons.

In view of the foregoing remarks, it is respectfully submitted that Claims 1-2, 4, 9, 12, 15, 17-18, 21, 38, 40, 44-45, 51, 55 and 67-70 now appearing in this application are allowable and such favorable action is respectfully requested.

Respectfully submitted,

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